PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP 03/09665	International filing date *(day/month/year)* 29.08.2003	Priority date *(day/month/year)* 02.10.2002
International Patent Classification (IPC) or both national classification and IPC B01F3/08		
Applicant UNILEVER N.V. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 1 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the opinion
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
09.03.2004	08.12.2004
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Muller, G Telephone No. +49 89 2399-2331

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP 03/09665

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:

Description, Pages

1-10 as originally filed

Claims, Numbers

1-6 received on 26.11.2004 with letter of 25.11.2004

Drawings, Sheets

1/2-2/2 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).

   ☐ the language of publication of the international application (under Rule 48.3(b)).

   ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   ☐ contained in the international application in written form.

   ☐ filed together with the international application in computer readable form.

   ☐ furnished subsequently to this Authority in written form.

   ☐ furnished subsequently to this Authority in computer readable form.

   ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

   ☐ the description, pages:

   ☐ the claims, Nos.:

   ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-6
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-6
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-6
	No:	Claims	

2. Citations and explanations

   see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

D1: DE 43 04 260 A (MARCO SYSTEMANALYSE UND ENTWICKLUNG GMBH) 18 August 1994

D2: DE 952 707 C (SIEMENS-SCHUCKERTWERKE AG) 22 November 1956 (1956-11-22)

The document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and shows (the references in parentheses applying to this document):
a method for preparing a dispersion of one fluid in another fluid by extruding one fluid, which is the dispersed phase through a membrane orifice into another fluid which is the continuous phase, whereby the extrusion is interrupted by the oscillation of a membrane.

The subject-matter of claim 1 differs from this known D1 in that a vibrating wire or plate is placed at a distance of less than 1 mm from the membrane orifice through which the dispersed phase is extruded.

The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

The problem to be solved by the present invention may be regarded as providing a method enabling a better control over the droplet size.

The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:
None of the available prior art discloses such a method or would render it obvious. In D2, the interruption of extrusion is caused by a disturbance in flow of the continuous fluid, itself caused by a magneto restrictive stub.

Claims 2-6 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

Claims

1. A method for preparing a dispersion of one fluid in another fluid by extruding one fluid, which is the dispersed phase, through a membrane orifice into another fluid which is the continuous phase, and wherein the extrusion is interrupted by a disturbance in flow of the continuous fluid characterised in that the disturbance is caused by a vibrating wire or plate which is placed at a distance of less than 1 mm from the membrane orifice through which the dispersed phase is extruded.

2. A method according to claim 1, wherein the wire or plate vibrates at a frequency of 0.1 to 2 kHz, preferably from 1 to 1.8 kHz.

3. A method according to claim 1 or claim 2, wherein the membrane orifice has a diameter of from 0.1 to 120 μm, preferably from 0.2 to 8 μm.

4. A method according to any of claims 1-3 wherein the disturbance in the flow or energy transfer is generated with microengineered electromechanical devices.

5. A method according to any of claims 1-4 wherein the membrane is operated under cross flow of the continuous phase.

6. Use of a method according to any of claims 1-5 for the preparation of an oil and water containing emulsion.